UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
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FEB 15 2018

Ref: 8ENF-RC

David C. Frydenlund
Senior Vice President, General Counsel
And Corporate Secretary
Energy Fuels Resources (USA) Inc.
225 Union Boulevard, Suite 600
Lakewood, Colorado 80228

Re: Report for CERCLA Off-Site Rule (OSR) Site Visit of White Mesa Mill, May 10, 2017

Dear Mr. Frydenlund:

On May 10, 2017, the EPA conducted a CERCLA OSR site visit of your facility. The September 22, 1993, Off-Site Rule established the criteria for determining whether facilities are acceptable for the off-site receipt of CERCLA wastes from response actions authorized or funded under CERCLA. The criteria for a facility's acceptability to receive CERCLA wastes are that no "environmentally significant release of hazardous substances has occurred at the facility unless the release is controlled by an enforceable agreement for corrective action under an applicable Federal or State authority" and that there are no relevant violations at the unit or units receiving the CERCLA wastes.

White Mesa Mill operates under a Radioactive Materials License No. UT 1900479 issued by the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control (DWMRC) and a Groundwater Discharge Permit No. UGW370004 issued by the DWMRC pursuant to the Utah Cod Ann. Utah Water Quality Act.

Under this license, the facility accepts and processes uranium-bearing material from CERCLA removal or remedial actions in accordance with the CERCLA Off-Site Rule, 40 CFR Section 300.440. These uranium-bearing materials are processed to extract uranium. The residuals or tailings from this process, defined as 11e.(2) byproduct material excluded from the definition of solid waste under the Resource Conservation and Recovery Act (RCRA), are placed in cells at the site.

EPA personnel conducting this site visit included Mr. David Duster, RCRA inspector, Ms. Treasure Bailley, physical scientist, and me. We were also accompanied by Mr. Ryan Johnson, the Utah Department of Environmental Quality (UDEQ), Division of Waste Management and Radiation Control (DWMRC) inspector.

Facility representatives present at the site included Logan Shumway, Mill Manager, David Turk, Environmental Compliance, Health & Safety Manager, and you. Ms. Kathy Weinel, Quality Assurance Manager, provided information prior to the site visit. Your facility records are organized and easily accessible, and your staff is well trained and knowledgeable.

A copy of the report is enclosed for your review, and a copy has been sent to Mr. Phillip Goble, DWMRC supervisor, and Mr. Scott Clow, Ute Mountain Ute (UMU) Environmental Programs Director.

I wish to thank you and the other facility personnel for the cooperation and courtesy shown to me during this site visit. If you have questions concerning the enclosed report, please contact me at (303) 312-6503 or at jacobson.linda@epa.gov.

Sincerely,

Linda Jacobson

Linda Jacobson
RCRA Inspector

Enclosure

cc: Phillip Goble, UDEQ DWMRC
Scott Clow, UMU

U.S. ENVIRONMENTAL PROTECTION AGENCY – REGION 8
ENFORCEMENT, COMPLIANCE AND ENVIRONMENTAL JUSTICE DIVISION
CERCLA OFFSITE RULE SITE VISIT REPORT

Facility:	White Mesa Mill Energy Fuels 6425 South Highway 191 Blanding, UT 84511
Facility Contact:	David Frydenlund, Counsel, Vice-President
Telephone Number:	(435) 678-2221 (Main)
Notification Status:	Non-Notifier/Regulated by the NRC License Issued by the State of Utah
Report Type:	CERCLA Offsite Rule Site Visit
Date:	May 10, 2017
Time In:	8:55 am
Time Out:	4:00 pm
Weather:	warm, clear
Facility Participants:	Logan Shumway, Mill Manager David Turk, Environmental Compliance, Health & Safety Manager
EPA Representatives:	Linda Jacobson, RCRA Inspector David Duster, RCRA Inspector Treasure Bailley, Physical Scientist
State Representative:	Ryan Johnson, Inspector

Background

This was an arranged CERCLA Offsite Rule site visit of the White Mesa Mill, owned by Energy Fuels, located approximately six miles south of Blanding, Utah. The Off-Site Rule was promulgated to avoid having CERCLA wastes from response actions authorized or funded under CERCLA contribute to present or future environmental problems by directing these wastes to management units determined to be environmentally sound (preamble to final OSR, 58 FR 49299, 29201, September 22, 1993). The purpose of this site visit was to evaluate the facility's compliance with its state-issued license and permits so the EPA may determine whether it is environmentally sound under the CERCLA Off-Site Rule. To be acceptable to receive materials from CERCLA-funded cleanups or actions, a facility must currently be in compliance with applicable environmental laws. The facility also must not have any releases to ground water, surface water, soil, or air unless the releases are controlled by an enforceable agreement for corrective action.

The White Mesa Mill facility currently receives shipments from Dawn Mining Midnite Mine, a Superfund Site near Spokane, Washington. The material being shipped is water treatment plant residual sludges accepted at the White Mesa Mill as an alternative uranium feed stock material. The Radioactive Materials License was amended to allow receipt of this material under Amendment #07, July 10, 2014.

The facility processes natural uranium-bearing ores and certain specified alternate feed materials. The Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) amended the Atomic Energy Act (AEA) to revise the definition of byproduct material in section 11e. As a result of UMTRCA, the Nuclear Regulatory Commission (NRC) amended 10 CFR Part 40 to regulate the uranium and thorium tailings and wastes from the milling processes. Under normal operation, all tailings and wastes in an NRC- or agreement state-licensed mill producing uranium or thorium, which are classified as 11e(2) byproduct material, are disposed in tailings piles regulated under 10 CFR Part 40, and are not subject to EPA regulation under RCRA.

In 2004, the state of Utah became an agreement state with the NRC. Consequently, the nuclear license and the groundwater discharge permit are issued by the Utah Department of Hazardous Waste and Radiation. The Air Approval Order is issued by the Utah Department of Environmental Quality. There are two identified groundwater plumes at the facility, both of which are being addressed by state-issued orders. A Stipulation and Consent Order (SCO) for the May 7, 2012 corrective action plan (CAP) was finalized on December 12, 2012. The SCO required nitrate source control in the vicinity of the Ammonium Sulfate Crystal Tanks and also required pumping to establish hydraulic control of the plume. On September 16, 2015, a SCO approved the Corrective Action Plan for the chloroform plume.

Pre-Site Visit Preparation

Call with State

Since Utah, as an agreement state with the NRC, issues the radioactive materials license, the groundwater discharge permit, and the air approval order, and the EPA has no jurisdiction over 11(e)(2) material, Ms. Jacobson coordinated with the state, inviting them to participate in the site visit. A call was held with Mr. Phil Goble and Mr. Ryan Johnson on May 3, 2017, prior to a

separate meeting with Energy Fuels. Mr. Goble explained the regulation of the CERCLA material being received from Dawn Mining and its classification as an ore per the NRC. The material is accepted as an alternative feed material. The state representatives discussed the cells in use at the facility, the presence of two groundwater plumes at the site, and the access to all the monitoring data on the state website to which they later provided links in an email.

Meeting with Facility

Prior to the site visit, Ms. Jacobson scheduled a meeting with the facility representatives based in the Lakewood, Colorado office on May 3, 2017. The meeting focused on the main components of the site visit which included: participants, process overview, waste receiving, incoming material storage, cells/ponds, location of groundwater, surface water, air monitoring, and records review.

Ms. Jacobson also provided the facility with a list of the records to be reviewed and the items to be discussed during the site visit (see Attachment 1).

The facility provided copies of the documents discussed at the May 3, 2017 meeting on a flash drive. These documents include the following: 1) 3/2/11 Air Approval Order Modification; 2) 8/24/12 Utah Radioactive Material License Amendment No. 05 and the modified Utah Ground Water Discharge Permit; 3) 2/27/17 Semi-Annual Effluent Monitoring Report for July 1 through December 31, 2016; 4) 2/8/17 Discharge Minimization Technology (DMT) Performance Standards Monitoring Report and Cell 4A Best Available Technology (BAT) Performance Standards Monitoring Report for the 4th quarter of 2016; 5) 2/10/17 4th Quarter 2016 Groundwater Monitoring Report; and 6) 7/10/14 License Amendment 7 Radioactive Material License Number UT 1900479. These documents were copied to a disk and are included as an attachment to this report.

In addition to the flash drive, the facility representative provided a list of notes from the items discussed in the May 3, 2017, meeting, which addressed, among other things, the compliance status, reportable spills, cell (impoundment) usage and operational monitoring, and surface water monitoring. A copy of this list is also attached to this site visit report in Attachment 2.

Opening Interview

The EPA representatives and the state inspector, Ryan Johnson, who accompanied the EPA on this site visit, arrived at the facility at approximately 8:55 am. They were greeted by facility officials and shown to a conference room. Ms. Jacobson asked for receiving records, processing records, and inspection records. The facility and state representatives provided an overview of the facility's processes and waste management procedures.

Facility Overview

Materials receipt and screening

All ores get commingled from the front of the mill to the back. The facility can directly dispose of 11(e) 2 materials from direct-mining facilities. They explained that the Dawn Mining material is pretty homogeneous with a consistent uranium percentage. Production water is obtained from onsite wells. An Alternative Feed Circuit was constructed approximately 10 years ago. The

facility works 24/7 on a batch. They maintain the ALARA standard for radiation protection and control, meaning as low as reasonably achievable. The facility maintains both an R&D lab (metallurgical lab) and a chemical lab. Current lab wastes go to the tailings cells as 11(e)2 wastes.

Reclamation Plan/Facility Decommissioning

Per their state-issued, Radioactive Material License, the mill is required to maintain a financial surety that can cover the estimated costs for decommissioning and decontamination of the mill and mill site, reclamation of any tailings or waste disposal areas, groundwater restoration, and the long-term surveillance fee. The reclamation bond is reviewed annually; and inflation adjustments are made to ensure everything is covered. The facility is also required to perform archaeological studies of any disturbed area. The state mentioned that Rec Plan 5.1 is out for public comment now. The state looks at the reclamation plan at every license renewal, which occurs every 10 years. If the company should go out of business, the state would perform the reclamation under the bond; then DOE does the long-term monitoring. One million dollars will go to DOE to perform air and groundwater monitoring. The state offered the example of Lisbon Valley, a radiation site where the reclamation was being led by the UDEQ, and the state is preparing to turn it over to DOE.

Ore Storage Pad construction and operational requirements

The ore pad, comprising approximately 25 acres, is unlined, compacted soil. Both the facility and the state recognize that the ore storage pad is contaminated and will address it at decommissioning. The facility explained that the bedrock is not very deep below the pad, and there are monitoring wells downgradient of the ore pad. Additionally, the pad is graded so that everything drains to the evaporation pond.

There is no storage time limit for materials on the ore pad, but there are inspection requirements. No ponding of water is allowed, and any liquid pooling is removed.

The contaminated ore storage pad is grandfathered into the site reclamation plan. Additionally, the surety bond is required to include the materials in storage on the ore pad. The Reclamation Plan specifies placement of a foot of clay, two 60-ml HDPE liners, a geonet, and a leak detection system over the storage pad.

As part of the site visit, the inspection team was shown the Ore Storage Pad. Everything is transported in and out by trucks, which are decontaminated by power washing before they leave the site. The facility reuses the truck washwater until it is dirty, then the water and sediment go to the tailings cell. Washwater is also used for dust control in the summer, including spraying the ore piles with water.

The inspectors noted the condition of the Dawn Mining material in storage on the pad. The Dawn Mining material is shipped in 3-layer super sacs, which weigh approximately 6000 pounds each. It was noted that the super sacs were labeled as "UN 2910, Radioactive, Class-A, Unstable," received in the later part of 2016. The Dawn Mining totes contain equivalent feed. In 2016, 208 super sacks were shipped to White Mesa Mill. There were 62 sacks, all in good condition, awaiting processing during the May 2017 OSR visit.

Cell Constructions and Operation

White Mesa Mill uses lined impoundments, referred to as cells, for management of tailings, effluents, and evaporation of liquids. There are currently five cells at the mill: Cells 1, 2, 3, 4a, and 4b. Cells 5a and 5b will be built for future expansion. Leak detection in the older cells is rudimentary. The cells have an established flow rate and design flow rate of 24,000 gallons/day. The facility records the volumes that are pumped out of the leak detection system, which is zero on most days. There are freeboard requirements for the cells. Dam safety inspections are also conducted by their engineers. The facility must maintain and operate the cells according to standards and procedures reviewed by the state. All inspections, freeboard levels, pumped volumes, etc. are monitored and reported to the state. Regarding the life of the liners in Cells 4a and 4b which are HDPE versus the PVC liners in Cells 1, 2, and 3, the facility stated that the manufacturer guarantees the liners for 10's of years, not 1000 years.

Cell 1

Cell 1, dedicated to evaporation of Mill Waste solutions, is 55 acres in size. It was built in June 1981 with a single 30 mil PVC flexible membrane liner (FML). Cell 1 is operated as an evaporation pond. When asked if there had been leakage from Cell 1, Mr. Frydenlund stated that there was a tear on the liner near the surface, not leakage. On June 2, 2010, an accumulation of fluid was discovered in the Cell 1 leak detection system that was confirmed as originating from the cell. To repair the liner, the solution level was lowered so that repairs could be made to the liner. Following the repairs, the liquid level was raised. Facility representatives stated that any bottom leakage would be plugged from natural chemical reactions.

Cell 1 receives all residuals from ore processing, including any liquids that may include diesel, kerosene, etc. Additionally, the water recovered from the chloroform plume pump and treat system is placed in Cell 1. The pond contents have a pH of approximately 2 and contain high sulfate and salts. The pond is sampled on an annual basis. The facility also submits an annual tailings evaluation report which is accessible in a link that was provided to the EPA by the state in an email prior to the site visit.

The EPA asked if the facility had considered replacing Cell 1 due to age and construction. The facility stated that the leak detection system for Cell 1 is not detecting leakage from this unit. They also stated that, should there be a problem, the evaporation pond liquid could be quickly pumped to Cell 4b and Cell 1 easily remediated.

There are four monitoring wells (three downgradient) and one chloroform well to be sampled for Cell 1. There are a leak detection system and monitoring wells (80 to 100 feet to first aquifer), and groundwater flows approximately 1 foot/year. The state added that there is a compliance point well for the state for leak detection. Additionally, two state hydrogeologists review the uranium mill reports.

During the site visit, the inspectors were shown Cell 1. A point-red alarm means there is liquid in the sump. Freeboard measurements are taken weekly using a story pole and transit. There are a minimum of four inlets observed to Cell 1. The liner is covered with soil to prevent UV exposure.

Cell 2

Cell 2 is in closure and no longer receiving tailings or liquids. It is 67 acres, was built in May 1980, and has a single 30-mil PVC FML. Cell 2 contains Mill tailings, has an interim cover, and is closed to future tailings disposal.

The Cell 2 radon flux is down to 0.5 picocuries. A third party company, TellCo, out of Grand Junction, monitors for radon using Method 115, as required by NESHAPS, placing 100 canisters across the cell. The facility reports the average radon reading to the state.

The facility is placing a Phase 1 cover on Cell 2. A Stipulation and Consent Agreement (SCA) was executed on February 23, 2017, regarding the Cell 2 cover. The SCA includes the Phase 1 cover construction, the test section design and construction, the test section monitoring, the performance criteria, settlement monitoring and performance criteria, reporting, determination of the performance of the cover design, Phase 2 cover construction, revegetation, credit against reclamation cost. The SCA required that the Cell 2 Phase 1 cover placement commence in April 2016 and be completed on or before August 2017 or by a later date as approved by the state. The facility constructed a performance monitoring test section with the Cell 2 cover concurrently with the Phase 2 cover placement. The Test Section is a 100 ft. by 100 ft. test plot, for which the facility will monitor vegetation and piezometers over a 7-year process. The first layer of the permanent cover, placed in Phase 1, will be approximately four feet thick. The final cover, placed in Phase 2, will include a radon barrier, root-resistant barrier, and a nine-foot thick final cover that is supposed to last 1000 years.

The state described the vegetation on the evapotranspiration cover as being native materials such as grasses that do not have deep roots. The infiltration barrier will also discourage burrowing animals. The facility added that the cover will be sloped to address runoff and ponding concerns.

During the physical portion of the site visit, it was noted that Cell 2 was covered by Phase 1 soils. A test patch had been established for an evaporative cover with a dedicated meteorological station. The facility monitors both infiltration and vegetation.

Cell 3

Cell 3 is 71 acres, was constructed in September 1982, and has a single 30-mil PVC FML. Cell 3 contains Mill tailings. It also accepts other Mill wastes and 11e(2) material from in-situ recovery operations. Cell 3 is in the final stages of filling. The facility is also putting Phase 1 cover on Cell 3, the initial step toward closure. A portion of Cell 3 has a 1 ½ foot cover. It was noted during the physical portion of the site visit that trash had been placed on the open, active part of the cell.

Cell 4a

Cell 4a receives liquids and tailings (sands). Cell 4a is 40 acres and was relined in 2008. Cell 4a is double-lined with a 60 ml HDPE liner and a leak detection system. A monitoring well along the berm was noted during the physical portion of the site visit.

Cell 4b

Cell 4b is 40 acres, was constructed in 2011, and is double-lined. Cell 4B is used for evaporation of mill solutions. All ponds can overflow into Cell 4b. It is used as an evaporation pond only. Any leakage in 4a or 4b is pumped back into the cell. It was noted during the physical site visit

that Cell 4b had aluminum sulfate crystals on the side above the liquid level. Approximately 67,000 gallons have been pumped out of the leak detection system of this cell in approximately five years of operation.

Closure of Roberts Pond and Current Management of Stormwater

Roberts Pond, a storm water pond, was removed approximately three years ago. Storm water now goes to Cell 1. The stormwater plan, as part of their groundwater discharge permit, allows no standing water. Any spills or releases to sumps, as well as other spills, stay onsite and go to the cells eventually.

Facility Plumes

The groundwater flow direction is predominantly southwest at approximately one foot/year. There are two identified plumes at the facility: a chloroform plume and a nitrate plume, both of which are being addressed under enforcement orders with the state. When the state became the site lead, the monitoring system network went from 17 to 75 wells, with slug tests being performed on every new well.

Chloroform Plume

On August 23, 1999, the state issued the facility a Notice of Violation and Groundwater Corrective Action Order to initiate a contamination investigation of the groundwater based on the detection of chloroform and other constituents. On September 16, 2015, a state order approved the Corrective Action Plan for the chloroform plume. The facility has delineated the extent of the chloroform plume. They are performing pump and treat and placing the contaminated water into Cell 1. The facility performed soil gas testing and did not find a source to remediate. Before the mill was built, there was a temporary lab located here used for ore buying. According to facility representatives, early mill lab wastes were discharged to a leach field, and chloroform from locals was also dumped down the drain into the leach field. Current lab wastes go to the tailings cells as 11(e)2 wastes.

Nitrate Plume

Nitrate was first detected as part of the investigation of a chloroform plume discovered in a perched well in 1999. Nineteen temporary perched zone nitrate wells have been installed to delineate and monitor the nitrate. Nitrate concentrations at downgradient wells have been relatively stable. There are no known unaddressed ongoing sources; however, it has not been possible to quantify or confirm the potential historic sources. The facility and state entered into a Stipulated Consent Agreement on January 28, 2009, requiring Energy Fuel Resources to complete a Contaminant Investigation Report, which was submitted in January 2010. During the site visit, the facility stated that the source of the nitrate plume was in question, since there was a military base on site where they staged Pershing Missiles. The military had access to the whole site in the early 1960s. Additionally, the nitrate, per the facility, is located upgradient of the facility operations. The state and facility decided to focus on addressing the plume, rather than continuing definition of potential sources. A corrective action plan (CAP) was developed that was approved on May 7, 2012. A Stipulation and Consent Order (SCO) for the May 7, 2012, CAP was finalized on December 12, 2012. The SCO required nitrate source control in the vicinity of the Ammonium Sulfate Crystal Tanks and also required pumping to establish hydraulic control of the plume.

Air Monitoring

The predominant air flow direction is to the northeast. In the evenings, the predominant direction is to the southeast. Air monitoring stations are located outside the restricted area. The facility operates their own weather station as well as fence-line radon monitoring. In addition, they perform mill dose modeling. The facility was informed that the EPA and state inspectors would be conducting an air inspection the following week, which would include the evaluation of compliance with the requirements of the new NESHAPS Subpart W rule.

Interactions with Tribe

Ms. Bailley oversees the Ute Mountain Ute water grant and also provides technical assistance to the Tribe. A copy of her report for this site visit is included as Attachment 4. Some of the concerns with the characterization of the site groundwater contamination were discussed, including the age of the isotope study conducted by the University of Utah about ten years ago, changing site conditions, including draining of the wildlife ponds, changing groundwater concentrations in MW-22 and other wells, the necessity of the installation of additional wells, and inclusion of additional parameters in the groundwater monitoring program. The EPA and the facility agreed to hold a follow-up meeting on groundwater issues.

Records Review

The inspectors reviewed the Bill of Lading records for CERCLA material shipments for the Dawn Mining materials, which was the only material from a CERCLA-funded activity being received by the facility at the time of the inspection and comprises only 2 to 3% of the mill's feedstock. They received a list of the Alternate Feed from Dawn Mining from May 18, 2016, through December 12, 2016, which consisted of 208 bags total. The facility had processed all but 62 super sacs, which were remaining in the ore storage yard. The inspectors also looked at the Ore Storage Inspections as part of the plant weekly inspection report logs.

Ms. Jacobson reviewed the March 2017 daily, weekly, and monthly inspections for cells. She also reviewed the slimes recovery test for Cell 2. The recovery test duration is five to six days. The slime builds up to its height, stabilizes for 3 hours, then the pump is turned back on to determine slimes level and to indicate whether the slime level is decreasing over time.

It was noted by EPA that the facility has a good inspection system and leak detection system for the newer cells. In addition to required inspections by the facility, the state conducts at least 20 inspections annually.

Inspection Close-Out and Discussion of MW-22

Following a lunch break, the facility staff and inspection team drove to MW-22, a monitoring well installed in approximately 1994, where there have been changing groundwater concentrations and detections of constituents of concern to the Ute Mountain Ute Tribe. The purpose was to show the distance of the well from the mill. The facility representatives explained that, based on constituents found, groundwater flow rate and direction, they question whether the

detections are from mill operations. The need for additional characterization of the hydrogeology in the area southeast of the mill site between the tailings ponds and MW-22 was briefly discussed. It was to be one of the topics in a follow-up meeting on groundwater issues. During the closeout, the EPA expressed their preference that Cells 4a and 4b be used for management of tailings and liquids from the processing of CERCLA materials, since these are double-lined cells with leak detection systems.

The inspection team thanked the facility for their time and courtesy and departed.

Acceptability Status and Determination

The site visit is only one factor which is considered in this determination. The information gathered from discussions with the state and facility personnel, compliance with state and federal regulations, observations during the physical site visit, review of documents provided by the facility and available on the state's website, as well as those reviewed during the site visit, will also factor into the EPA's determination of the facility's continued acceptability to receive materials or wastes from CERCLA-funded actions.

Recommendations Based on Site Visit

Based on the site visit observations, discussions with the state, and review of materials prior to and since the visit, we offer the following recommendations for the facility's consideration: 1) installation of an impermeable liner for portions of the ore pad for unprocessed ore and feedstock while in operation and until closure; 2) removal of Cell 1 from service for installation of a double liner and leak detection system; 3) installation of additional monitoring wells in the southeast to characterize the groundwater flow in the direction of the White Mesa community; and 4) consideration of a new isotopic study since site conditions have changed in the last decade.

Prepared by:

Linda Jacobson

Linda Jacobson, EPA Inspector

2/14/2018

Date

Attachments:

Attachment 1: Copy of list of requested items to be reviewed during site visit
Attachment 2: Copies of Documents Provided by Facility from May 3, 2017, Meeting on Disk and Accompanying Facility Notes
Attachment 3: Copies of Documents Received during Site Visit
Attachment 4: Treasure Bailley's report